Statement of Basis

Guam Waterworks Authority
Baza Gardens Sewage Treatment Plant
Final NPDES Permit No. GU0020095

I. INTRODUCTION/FACILITY DESCRIPTION

The Guam Waterworks Authority owns and operates the Baza Gardens Sewage Treatment Plant (STP) which serves Tolofofo and surrounding communities (population 500-999 persons) on the island of Guam. The Baza Gardens STP consists of a wastewater treatment plant with a design capacity of 0.6 million gallons per day (MGD), which discharges through Discharge Serial No. 001: 13° 22' 16" N latitude, 144° 44' 49" E longitude to the Togcha River Exfiltration Trench. The Togcha River Exfiltration Trench consists of a lime stone bed rock pit layered with various sizes of limestone rock and clean crushed coral. It is designed to reduce the velocity of the effluent and to defuse its entry into the receiving waters. Secondary effluent from the Exfiltration Trench is discharged to Category S-3 (Low) receiving waters named Togcha River, tributary to the Philippine Sea. (Category S-3 waters are primarily used for commercial, agricultural, and industrial activities. Aesthetic enjoyment and compatible recreation are acceptable in this zone, as well as maintenance of aquatic life. Compatible recreation may include limited body contact activities.) This discharge serial is located approximately 60 feet from the tributary. The Baza Gardens STP became operational in 1975 with plant renovations completed in 1992.

In accordance with Section 402 of the Clean Water Act (CWA), the U. S. Environmental Protection Agency, Region 9 (USEPA Region 9) is issuing a NPDES permit to the permittee for the discharge of treated domestic wastewater from Baza Gardens STP into the Togcha River. The STP outfall discharges within territorial waters of the Territory of Guam. Because the Guam Environmental Protection Agency (GEPA) has not been delegated primary regulatory responsibility for administering the NPDES program, the USEPA Region 9 is issuing a NPDES permit which incorporates both federal CWA and Guam water quality requirements. On April 8, 1991, the permittee submitted an application for renewal of its existing NPDES permit. A draft permit was public noticed by the USEPA Region 9 on November 19, 1999. This Statement of Basis sets forth the principal facts and significant legal, methodological, and policy questions considered in the development of the permit. The permit is based on the Administrative Record.

II. DISCHARGE LIMITATIONS

When developing discharge limitations, the permitting authority must consider both limitations based on technology available to treat the pollutants (i.e., technology based limitations) and limitations that are protective of the designated uses of the receiving waterbody (i.e., water quality based limitations). Discharge limitations in the permit are based on USEPA regulations contained in Title 40 of the *Code of Federal Regulations* (CFR) and *Revised Guam Water Quality Standards* (WQS), amended and adopted on January 2, 1992.

Technology Based Discharge Limitations

The permit contains the following technology based discharge limitations for biochemical oxygen demand and total suspended solids:

Discharge Limitations				
Discharge Parameter	Average Monthly	Average Weekly	Maximum Daily	Units
Biochemical Oxygen Demand (5-day)	30 150	45 225	n/a	mg/l lbs/day
	The arithmetic mean of the BOD_5 values, by concentration, for effluent samples collected over a calendar month shall not exceed 15% of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.			
Total Suspended Solids	30 150	40 200	n/a	mg/l lbs/day
	The arithmetic mean of the TSS values, by concentration, for effluent samples collected over a calendar month shall not exceed 15% of the arithmetic mean, by concentration, for influent samples collected at approximately the same times during the same period.			

The monthly average and weekly average discharge limitations for biochemical oxygen demand and monthly average discharge limitations for total suspended solids (in mg/l and influent percent removal efficiency) are based on federal secondary treatment effluent standards contained in 40 CFR 133.102(c). The weekly average discharge limitation for total suspended solids (in mg/l) is based on requirements contained in Section II.B.6 of *Revised Guam Water Quality Standards*. The discharge limitations for biochemical oxygen demand and total suspended solids (in lbs/day) are calculated using an average daily design flow of 0.6 MGD and the following equation: lbs/day = 8.34 x Ce x Q. "Ce" is the discharge limitation in mg/l and "Q" is the flow rate in MGD.

Water Quality Based Discharge Limitations

If, after technology based discharge limitations are applied, the permitting authority determines that the discharge may exceed applicable water quality criteria, then water quality based discharge limitations must be imposed. When deciding whether or not water quality based discharge limitations are needed to protect water quality, in accordance with 40 CFR 122.44(d), the permitting authority must determine whether the discharge causes, has the reasonable potential to cause, or contribute to an excursion of applicable numeric or narrative water quality criteria. As part of this evaluation, projected receiving water values – based on reported maximum discharge values – are compared to applicable water quality criteria to determine the "reasonable potential" for criteria exceedances and the need for discharge limitations. Because this discharge has not been granted a mixing zone by the GEPA, dilution (expressed as parts receiving water per part wastewater) is not considered in this evaluation and projected receiving

water values are calculated using the following steady state equation: Cr = Ce. "Ce" is the reported maximum discharge value (in mg/l or ug/l) and "Cr" is the projected receiving water value (in mg/l or ug/l) which is then compared to the appropriate water quality criterion.

The USEPA Region 9 reviewed Discharge Monitoring Report data provided by the permittee:

Station ID	Date	BOD mg/l	pH (units)	Suspended Solids (mg/l)	Fecal Coliform (CFU/100ml)	Chlorine Residual (mg/l)
001	03/31/98	36	7.69	16	>400	0.01
001	04/30/98	42	7.55	44	>400	0.01
001	05/31/98	35	7.55	41	>400	0.01
001	06/30/98	37	7.43	24	>400	0.01
001	07/31/98	31	7.68	22	>400	0.01
001	08/31/98	49	7.49	20	>400	0.02
001	09/30/98	39	7.55	24	>400	0.01
001	10/31/98	53	7.3	25	>400	0.01
001	11/30/98	33	7.3	18	>400	0.01
001	12/31/98	40	7.4	10	>400	0.01
001	01/31/99	36	7.6	12	>400	0.01
001	02/28/99	43	7.3	23	>400	0.01
001	03/31/99	54	7.4	9	>400	0.01
001	04/30/99	50	7.4	14	>400	0.01
001	05/31/99	44	7.4	20	>400	0.01
001	06/30/99	53	7.4	28	>400	0.01

Based on this review, the USEPA Region 9 concluded that total suspended solids, *E. coli*, and chlorine have the "reasonable potential" to exceed the following applicable WQS:

Effluent Characteristic	Average Monthly	Maximum Daily	Units
Total Suspended Solids	n/a	40	mg/l

E. coli	126	406	CFU/100 ml
Chlorine	11 (4-day average)	19 (1-hour average)	ug/l
pH	Not less than 6.5 nor greater than 8.5 at any time.		standard units
Orthophosphate (PO_4-P)	n/a	0.10	mg/l
Nitrate-Nitrogen (NO_3-N)	n/a	0.50	mg/l
Turbidity	n/a	1.0	NTU

In accordance with 40 CFR 122.44(d), the permit contains the following water quality based discharge limitations for total suspended solids, *E. coli*, and total chlorine residual. Discharge limitations for total chlorine residual (in ug/l) are calculated using the statistical procedure outlined in Chapter 5 of the revised *Technical Support Document for Water Quality-based Toxics Control* (TSD; EPA/505/2-90-001, 1991).

Discharge Limitations				
Effluent Characteristic	Average Monthly	Average Weekly	Maximum Daily	Units
E. coli	126	n/a	406	CFU/100 ml
Total Chlorine Residual	6.1 0.031	n/a	12 0.060	ug/l lbs/day
pH	Not less than 6.5 nor greater than 8.5 at all times.			standard units
Orthophosphate (PO_4-P)	report	n/a	0.10 0.50	mg/l lbs/day
Nitrate-Nitrogen (NO_3-N)	report	n/a	0.5 2.5	mg/l lbs/day
Turbidity	n/a	n/a	1.0	NTU

Because the WQS for pH is more stringent than the technology based discharge limitation of "not less than 6.0 nor greater than 9.0 at all times", the permit contains a water quality based discharge limitation for pH. Because domestic sewage will contain nutrients, the permit contains water quality based discharge limitations for the nutrients, orthophosphate (PO_4-P) and nitrate-nitrogen (NO_3-N). Because domestic sewage will contain both organic and inorganic particulate material and because turbid water can interfere with beneficial uses (e.g., aesthetic enjoyment, maintenance of aquatic life), a water quality based discharge limitation is included for turbidity. Discharge limitations (in lbs/day) are calculated using an average daily design flow of 0.6 MGD and the following equation: lbs/day = 8.34 x Ce x Q. "Ce" is the discharge limitation in mg/l and "Q" is the flow rate in MGD.

Because the Baza Gardens STP discharge does not fully comply with water quality based

discharge limitations for *E. coli* and chlorine, the USEPA Region 9 is concurrently issuing an Administrative Order which will include: (1) a schedule of activities to ensure that the discharge will come into compliance with WQS during this permit term; and (2) interim discharge limitations based on current wastewater treatment plant performance. Reasonable control measures necessary to ensure compliance with WQS will likely include additional treatment controls to reduce the level of bacterial indicator organisms and the toxicity of chlorine in the discharge.

III. DISCHARGE AND RECEIVING WATER MONITORING PROGRAMS

The permit contains discharge monitoring requirements that are established based on best professional judgement. Parameters with discharge limitations are monitored at weekly intervals. Additional parameters including flow, enterococci, total Kjedahl nitrogen, ammonia nitrogen, dissolved oxygen, and temperature are also monitored weekly. Heavy metals, hardness, pesticides, oil and grease, and whole effluent toxicity (chronic) are monitored annually.

Receiving water monitoring requirements contained in the permit have been established based on best professional judgement and are necessary to evaluate the effects of the proposed discharge on Togcha River. This monitoring program establishes receiving water parameters, monitoring frequencies, and sample types at specified station locations in the river and bay. Five stations are located in Togcha River and three stations are located offshore of the mouth of Togcha River in the Philippine Sea. Flow, enterococci, pH, total phosphate (TP), orthophosphate (PO_4-P), total nitrogen (TN), nitrate-nitrogen (NO_3-N), dissolved oxygen, turbidity, and temperature are monitored bi-monthly.

IV. SLUDGE/BIOSOLIDS LIMITATIONS AND MONITORING REQUIREMENTS

On February 19, 1993, the USEPA issued a final rule for the use and disposal of sewage sludge (40 CFR 503). This rule requires that producers of sewage sludge meet certain reporting, handling, and disposal requirements. The Territory has not been delegated the authority to implement this program, therefore, the USEPA Region 9 is the implementing agency. The permit contains biosolids/sludge management requirements consistent with 40 CFR 257, 258, and 503.

V. PERMIT APPEALS

The final permit shall become effective 45 days from date of signature by the Regional Administrator. Any appeal of this permit will be processed by the USEPA Region 9 in accordance with 40 CFR 124, Subpart E.
Persons wishing further information may write to the address(s) given below, or call Robyn Stuber of USEPA Region 9 at 415/744-1921. Copies of materials in the Administrative Record (other than those which the USEPA Region 9 maintains as confidential) are available at the

USEPA Region 9 office for inspection and copying between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday (excluding holidays).

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